IN THE CLAIMS

1. (Original) A method of correcting for a tilt in a mammogram, the method comprising:

classifying pixels as either likely fat or likely not-fat;

identifying a candidate tilt; and

calculating a histogram of the likely fat and the likely not-fat pixels at the candidate tilt; and

evaluating a quality of the candidate tilt based on features of the histograms of pixel values in the fat and the dense tissue classes.

2. (Original) The method of claim 1, wherein evaluating the quality of the candidate tilt based on the features of the histograms comprises:

evaluating a quality of the candidate tilt based on a skew and variance of the histograms.

3. (Original) The method of claim 2, wherein evaluating the quality of the candidate tilt comprises calculating a weighted Mahalanobis distance between the likely fat and the likely not-fat distributions to determine a quality of the candidate tilt.

4. (Original) The method of claim 3, wherein evaluating the quality of the candidate tilt further comprises giving more weight to the variance of the fat distribution in the weighted Mahalanobis distance calculation.

5. (Original) The method of claim 3, wherein evaluating the quality of the candidate tilt further comprises using the skewness of the fat histogram to give a preference to distributions that are not skewed to the negative side.

6. (Original) The method of claim 3, wherein evaluating the quality of the candidate tilt further comprises adjusting the result to favor smaller tilts.

7. (Original) The method of claim 3, wherein evaluating the quality of the candidate tilt comprises applying the equation:

$$D(p_x, p_y) = \frac{m_d - m_f}{\sqrt{(0.7\,\mathrm{var}_f + 0.3\,\mathrm{var}_d)}} + 0.5\inf(0, skew_f) - 0.1|p_x| - 0.1|p_y|$$

8. (Original) The method of claim 1, wherein identifying the candidate tilt comprises identifying a first set of candidate tilts, based on an expected tilt distribution.

9. (Original) The method of claim 8, further comprising identifying a subsequent set of candidate tilts, based on the best tilt identified in a previous iteration, to provide more accurate tilt.

10. (Original) The method of claim 1, wherein classifying pixels as either likely fat or likely not-fat comprises:

generating a smoothed image;

subtracting the smoothed image from an original image; and

determining whether pixels are convex to classify the pixels as likely not-fat, or concave to classify the pixels as likely fat.

11. (Original) The method of claim 10, wherein the pixels are classified individually.

12. (Original) An apparatus to correct a tilt in a mammogram comprising:

a dense/fat classifier to classify pixels as either likely fat or likely not-fat;

a candidate tilt identifier to identify a candidate tilt; and

a histogram creator to calculate a histogram of the likely fat and the likely not-fat pixels at the candidate tilt; and

a tilt quality evaluator to evaluate a quality of the candidate tilt based on features of the histograms of pixel values in the fat and the dense tissue classes.

13. (Original) The apparatus of claim 12, wherein the tilt quality evaluator uses a skew and variance of the histograms to evaluate the tilt quality.

14. (Original) The apparatus of claim 13, wherein the tilt quality evaluator further comprises a Mahalanobis calculator to calculate a weighted Mahalanobis distance between the likely fat and the likely not-fat distributions to determine a quality of the candidate tilt.

15. (Original) The apparatus of claim 14, wherein the tilt quality evaluator further comprises a quality calculator to give more weight to the variance of the fat distribution in the weighted Mahalanobis distance calculation.

16. (Original) The apparatus of claim 14, wherein the tilt quality evaluator further comprises a quality calculator to use the skewness of the fat histogram to give a preference to distributions that are not skewed to the negative side.

17. (Original) The apparatus of claim 14, wherein the tilt quality evaluator further comprises a quality calculator to adjust the result to favor smaller tilts.

18. (Original) The apparatus of claim 14, the tilt quality evaluator evaluates the tilt quality using the following equation:

$$D(p_x, p_y) = \frac{m_d - m_f}{\sqrt{(0.7\,\mathrm{var}_f + 0.3\,\mathrm{var}_d)}} + 0.5\inf(0, skew_f) - 0.1|p_x| - 0.1|p_y|$$

19. (Original) The apparatus of claim 12, wherein the candidate tilt identifier to identify a first set of candidate tilts, based on an expected tilt distribution.

20. (Original) The apparatus of claim 19, the candidate tilt identifier further to identify a subsequent set of candidate tilts, based on the best tilt identified in a previous iteration, to provide more accurate tilt.

21. (Original) The apparatus of claim 12, wherein the dense/fat classifier comprises:

a smooth image generator to generate a smoothed image;

a delta calculator to subtract the smoothed image from an original image; and

a pixel classifier to determine whether pixels are convex to classify the pixels as likely not-fat, or concave to classify the pixels as likely fat.

22. (Original) The apparatus of claim 21, wherein the pixels are classified individually.

23. (Original) An apparatus comprising:

an image receiver to receive a digitized mammogram image, the digitized mammogram image representing a mammogram taken with non-parallel imaging plates;

a tilt corrector to evaluate a plurality of candidate tilts designed to correct for the non-parallel imaging plates;

an image adjustor to adjust the digitized mammogram image in accordance with a best candidate tilt; and

an output mechanism to output the corrected mammogram image, the corrected mammogram image used for computer aided diagnosis to detect abnormalities in the corrected mammogram image.

24. (Original) The apparatus of claim 23, wherein the tilt corrector comprises:

a dense/fat classifier to classify pixels as either likely fat or likely not-fat;

a candidate tilt identifier to identify a candidate tilt; and

a histogram creator to calculate a histogram of the likely fat and the likely not-fat pixels at the candidate tilt; and

a tilt quality evaluator to evaluate a quality of the candidate tilt based on features of the histograms of pixel values in the fat and the dense tissue classes.

25. The apparatus of claim 24 wherein the tilt quality evaluator evaluates the quality of the candidate tilt based on a skew and variance of the histograms.